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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,385	10/16/2003	DeQuan Yu	10541-1839	2129

28866 7590 04/10/2007  
MACMILLAN, SOBANSKI & TODD, LLC  
ONE MARITIME PLAZA - FIFTH FLOOR  
720 WATER STREET  
TOLEDO, OH 43604

EXAMINER	
MILLER, CARL STUART	
ART UNIT	PAPER NUMBER
3747	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/687,385	YU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Carl S. Miller	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 09 January 2007.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1,3 and 5-9 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1, 3 and 5-9 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892) 4)  Interview Summary (PTO-413)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948) Paper No(s)/Mail Date. \_\_\_\_ .  
3)  Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_ . 5)  Notice of Informal Patent Application  
6)  Other: \_\_\_\_ .

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Powell in view of Minagawa ('797).

Powell teaches the basic structure of applicant's system including a relief valve that produces a fuel pressure that remains relatively constant. The fuel pump produces fuel pressure that is relatively constant since it runs at a constant speed as a result of being fed by a constant voltage. Since the pressure regulator disclosed by applicant appears to be no different from those suggested by Powell, it is not clear how applicant's regulator would be more responsive to engine demand than that of Powell.

Minagawa clearly teaches a fuel system that uses an electrically driven pump and a non-return rail. Instead of using a fuel pressure sensor to determine fuel pressure Minagawa estimates the fuel pressure using flow rates and then sets the injector width based upon the estimated fuel pressure (See column 4, lines 27-30). The flow rates that are used are based upon engine demand in that they are proportional to the current rates to the pump that are, in turn, set by engine demand.

It would have been obvious to modify Powell by using the method of Minagawa to estimate the fuel pressure going to the rail and to use this pressure to set the injector pulse width

because both systems were non-return fuel rails systems being fed fuel by electrically driven pumps.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minagawa and Powell as applied to claims 1 and 6 above, and further in view of Gaskins.

Gaskins teaches the use of look-up tables to store input and output data for the control of electric pumps feeding a common rail fuel system.

It would have been obvious to use the tables of Gaskins to store the demand data used in Minagawa because the two references were using similar electric pumps in the same environment.

Applicant's arguments filed October 9, 2006 and January 9, 2007 have been fully considered but they are not persuasive. As previously noted, the applicants make note of the fact that the Powell reference specifically identifies three possible pressure regulators that could be used as element (23) in Powell. Powell clearly teaches a pressure regulator that is located in the fuel tank and returns fuel to the fuel tank. Secondly, the three regulators that are noted in Powell (US patent Numbers: 5,193,576; 5,163,472 and 4,936,342) all respond to the differential pressure between the fuel pressure and the manifold intake pressure. Since the manifold pressure is an indication of engine fuel demand, this pressure will vary with fuel demand as will the pressure within the fuel line beyond the pressure regulator. Thus, the output downstream of the pressure regulator will vary (as the claims require) even though the pump output is constant. Finally, all three of these regulators include springs.

With regard to applicant's January response, several comments are not understood. First of all, according to Patent Office records Claims 3 and 8 were addressed in the last office action. Secondly, the applicant refers to Claim 4 which has been cancelled. Thirdly, applicant talks about the Final Rejection as if that was the last office action, but the last office action was not made final.

Regarding more substantive matters, the applicant continues to state that his pressure regulator is vastly different from the ones suggested by Powell. The claims however simply claim a spring-type regulator. As pointed out above, the Powell regulators are spring-type regulators. Thus, the modification required of Powell is simply the use of an estimated fuel pressure to use for calculation of the injector pulse width. Minagawa teaches this concept.

Since the rejection of the last office action has been changed slightly and this change was not precipitated by applicant's amendment, this action has been made non-final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carl S. Miller whose telephone number is 571-272-4849. The examiner can normally be reached on MTWTHF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Cronin, can be reached at 571-272-4536. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Carl S. Miller  
Primary Examiner